Remarks

New claims 3 - 8 are added. In the following discussion, the numbered sections correspond in subject matter to the numbered sections of the action.

1. Formal correction of "stoke" to "stroke" is deferred pending some indication of allowance of the application.

2. With respect, it appears that the Examiner is misreading the application. On page 2, the term "impedance" does not refer to an "electrical" impedance but, quite specifically, to "mechanical" impedance. The latter term is well known to mechanical engineers (the co-inventor, Carroll, is an accomplished, senior mechanical engineer having several patents issued to him) and, quite simply, mechanical impedance (see application, page 3, 2nd full paragraph) limits mechanical movements in response to applied force. In the present invention, the mechanical impedance of a generator is increased for preventing excessively high generator speeds in response to excessively high energy inputs, e.g., resulting from the presence of ocean waves of excessive amplitudes.

The actual mechanical impedance increasing mechanism relied upon is fully described in the specification and makes use of the known fact that the force required to rotate a generator armature is a function of the amount of current flowing through the armature winding. Herein, in response to the detection of unusually high and potentially dangerous levels of input energy, the electrical impedance of the electrical load on the generator is reduced for (in accordance with Ohm's law) increasing the current flowing from the generator to the load (and through the armature winding).

The matter is readily understood qualitatively. Assume, for example, that the energy input is constant and that the generator is rotating at a

fixed speed and generating electrical power used for lighting an electric bulb. If, with no other change, a second light bulb is turned on in a circuit parallel to that of the first bulb (thus decreasing the electrical impedance of the output load and thus tending to draw. from the generator, twice the amount of current) the electrical power demand on the generator is doubled.

With no change in the input power level, the power demand can not be satisfied, and the effect of the increased loading of the generator, similarly as if a mechanical brake were being applied against the generator armature, is to cause a slow down of the rotational speed of the generator.

In accordance with the actual problem addressed by the present invention, as the input energy increases, the generator speed of rotation and the generator power output both increase. However, when the speed reaches a maximum safe value, the electrical load demand on the generator is deliberately increased to an amount even greater than that of the excessively high input energy level actively present. Such increased electrical loading, similarly as in the above steady state example, adds mechanical impedance to the generator thus immediately lowering the rotational speed and resisting further speed increases with further increases of input energy. Thus, reducing the electrical load impedance (for increasing the generator armature current) results in increased mechanical impedance of the armature for reductions in generator rotational speed. (Support for the foregoing discussion is in the specification; i.e., page 3, line 17 through page 6, line 8.)

With respect, the terminology used is consistent with generally accepted terminology, and the specification disclosure is fully enabling.

3. As is well known, and the specification is addressed to persons of skill in the power generation and power transmission arts, the efficiency of

power transfer is a function of the impedance matching of the power transfer links. In an electrical circuit, for example, maximum power efficiency transfer occurs when the electrical impedance at the output of a power source equals the electrical impedance of the load. Similarly, as noted in the specification in the first full paragraph of page 3, mechanical power generating systems are designed for operation at maximum possible efficiency. This is accomplished (lines 6 - 8) when the various mechanical impedances are matched. In contrast to this, however, as noted at the bottom of page 3, the inventive process is to adjust the impedance of the system from optimum values to high levels. Thus, by deliberately increasing the mechanical impedance of the generator for, as described in section 2 above, resisting excessive rotational speeds of the generator, the efficiency of transfer of energy of the entire system is also reduced thereby conveying less of the input energy from the surface waves through the system. Two effects are present; greater stiffness of the generator, generally equivalent to the use of a mechanical brake on the generator armature; and reduction of energy transfer efficiency whereby less input energy passes through the system, thus requiring less "braking."

The "factor" is a ratio of the efficiency of power transfer at optimum impedance matching in the system versus the efficiency of power transfer when the impedance is deliberately mismatched (specification, bottom of page 3).

The undersigned does not know how the actual factor of ten was arrived at. It may be based simply on applicants' knowledge of known design rules for power transfer trains. In any event, the number is given solely by way of example which can obviously vary depending upon the particular system involved. At this point, the burden is on the Examiner to make at least an initial

showing that the disclosed information is incorrect and/or that it somehow results in a failure to provide an enabling disclosure. With respect, the Examiner has not accomplished this nor even attempted such showing. In section 2, for example, the Examiner provided a basis (Ohm's law) for his opinion that the disclosure is incorrect. A similar basis is required for the present section - thus enabling the applicant to better address the issue.

5. For the reasons explained in sections 1 and 3 above, this rejection is believed overcome. Note that the claims specify increasing the mechanical impedance of the generator which, as explained, results from increasing the current to the load from the generator.

7. With respect, the Examiner is misconstruing the requirement that the claims particularly point out and distinctly claim the invention as also requiring that the claims provide an enabling disclosure. This is the function of the specification.

The invention is to an improvement of existing systems. Starting with one such system, it would have characteristics including first rates at which the system is designed to operate and second rates which would cause mechanical damage. Persons of skill using such existing systems would know such rates, and they vary from system to system. But, for any given system, such rates would be quite definite and, most importantly, known.

An example of a source of input energy described in the specification is surface waves on a body of water. Page 3 of the specification (lines 5 and 6) also refers to wind and water flow sources of energy. To the extent that such sources of energy are variable and can be excessively large, the present invention has utility in protecting such wind and water flow systems, as well as others.

The problem of high energy is that the mechanism directly responsive to the natural energy source is generally always exposed to the source.

The present application illustrates a float 10 on the surface of the water. If the float is unattended (a preferred arrangement) it may well be exposed to storm conditions and unusually high waves. The float will experience large displacements as determined by the size of the waves and, if too large, the displacements can cause damage to the system.

A windmill is a good example of a mechanism constantly exposed to the wind and subject to unexpected large wind gusts.

While various mechanisms are known for protecting the energy capturing means; e.g., submerging the float beneath the waves and turning the windmill blades out of the wind, etc., the present invention provides a different approach having an advantage explained in the specification (bottoms of pages 3 and 5), namely, that of providing substantially instantaneous protection against damage while still generating useful energy.

How the input energy is captured is fully described in the specification and is also well known, e.g., as disclosed in the patents cited by the Examiner. Briefly, the naturally occurring energy source, e.g., moving masses of water or wind, interact with an energy capturing means, e.g., a float or windmill, for causing reciprocating vertical motions of the float or rotation of the windmill blades. How the energy then captured is further conveyed and utilized is well known.

9. As above-explained, there are any number of arrangements for protecting energy converting systems from excessive input energies. Applicants' claimed arrangement involves varying the (electrical) impedance of the load for increasing the output current from the generator for increasing the mechanical impedance of the generator.

It does not appear to the undersigned that this is what is disclosed by Rynne. *In* Rynne, no moving parts are present (col. 7, line 45), and neither the concept of mechanical impedance nor changing the mechanical impedance is

present. Also, Rynne explains, at col. 8, lines 7 - 10, that during periods of intense wave action, the load may be increased to maximize extraction of as much energy as possible. This, however, is the exact opposite of what is accomplished according to applicants' claims. Thus, rather than increasing the load for the purpose of maximizing energy extraction, applicants' claims define a quite specific arrangement, involving increasing the mechanical impedance of the generator, for reducing the amount of input energy being extracted by the system during dangerous conditions. In Rynne, the object is to protect the shoreline; nothing is disclosed concerning protecting the energy converter. Also, by deliberately increasing the amount of energy captured, it is not seen how Rynne provides any mechanism for protecting his energy conversion system itself (rather than the shoreline) from damage due to excessively high waves. Accordingly, and quite aside from whether the shoreline is part of the system disclosed by Rynne, it is clear that the apparatus and method of Rynne are totally different from the claimed invention using an electrical generator whose mechanical impedance can be changed at will.

While Woodbridge does show a generator having moving parts, Woodbridge does not address the issue of protecting the generator against excessively high waves. Although it appears that the present invention might have utility in Woodbridge, because power being generated is passed through coils to generate an electromagnetic field (col. 3, lines 23-32), Woodbridge is entirely silent on the possibility of changing the amount of current through the coils for deliberately reducing the efficiency and increasing the system mechanical impedance.

New claims 3 - 8 are added. Support for these claims is in the specification beginning at page 6, bottom paragraph through the bottom paragraph on page 7. Neither Woodbridge nor Rynne appears to disclose or suggest technology relevant to the allowability of these claims.

Reconsideration and withdrawal of the application, along with allowance of the application are respectfully requested.

Respectfully submitted,

Michael Y. Epstein

Michael Y. Epstein
Attorney for Applicant
Reg. No. 21186
843-534-0840

Please send future correspondence to:

Michael Y. Epstein
Suite H
354 King St
Charleston, S.C. 29403

Thank you,
My Epstein